

MONTHLY WEATHER REVIEW,

MAY, 1878.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In compiling the present REVIEW the following data, received up to June 14th, have been made use of, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at one hundred and forty Signal Service stations and fourteen Canadian stations; monthly journals and means from one hundred and thirty-six of the former, and monthly means from thirteen of the latter; reports from twenty-five Special Sunset stations; two hundred and twenty-two reports from Voluntary Observers; thirty-one monthly reports from United States Army Post Surgeons; Marine Records; International Simultaneous Reports; monthly reports of the Weather Services of the States of Iowa and Missouri; reliable newspaper extracts and special reports. The most interesting features of the month have been: the return to normal temperatures east of the Rocky Mountains; the number and severity of tornadoes and thunder and hail-storms; and the heavy rain-falls along the eastern slope from Dakota to northern Texas and Arkansas.

BAROMETRIC PRESSURE.

In General.—On chart No. II is shown the general distribution of atmospheric pressure by the isobaric lines. Compared with the means of previous years, the pressure for the present month is slightly below normal, the deficiency being greatest over New England, where it averages about 0.05 of an inch.

Barometric Ranges.—These have been somewhat smaller than usual, and vary as follows: In New England, the greatest range was 0.86 in. at Eastport, and smallest, 0.75 at Springfield; Mt. Washington, 0.76. Middle States, 0.74 at Albany and New York, and 0.51 at Lynchburg. South Atlantic States, 0.67 at Cape Hatteras, and 0.38 at Tybee Island. Eastern Gulf States, 0.39 at St. Marks and 0.25 at Key West. Western Gulf States, 0.65 at Corsicana and 0.37 at New Orleans. Ohio valley and Tennessee, 0.67 at Pittsburg and 0.42 at Knoxville. Lake region, 0.87 at Alpena, 0.63 at Oswego. Upper Mississippi valley, 0.79 at St. Paul, 0.61 at St. Louis. Missouri valley, 1.06 at Yankton, 0.80 at Bismarck. Plains of Kansas and Nebraska (where the largest ranges occurred), 1.19 at Dodge City, and 1.05 at North Platte. Rocky Mountains and Western Plateau, 0.83 at Salt Lake City, and 0.57 at Santa Fé; Pike's Peak, 0.55. Pacific coast, 0.46 at San Francisco, and 0.28 at Los Angeles.

Areas of High Pressure in General.—Of these six have been sufficiently well marked to warrant description. No. II was attended by severe frosts from the 11th to the 14th.

No. I—appeared during the 1st on the coast of Oregon and Washington Territory; 11 p. m. barometer at Portland, Or., 30.35, or 0.28 above the normal, with cool northerly winds prevailing thence to Nevada and Utah; light snow and a SW. gale on the summit of Pikes Peak, with a temperature of 10°. 2d, a. m. barometer at Portland, 30.44, or 0.32 above normal; 11 p. m. barometer at Salt Lake City, 30.18, or 0.32 above normal; cool and clear weather prevailed throughout this region during the day, the minimum temperature at Boise City being 29°; at Winnemucca 31°, and Cheyenne 30°. A heavy NW. snow-storm also prevailed, during latter part of day, from Dakota to Manitoba, severe squalls being reported in the valley of the Red River of the North. 3d, a. m. barometer at Salt Lake City, 30.24, or 0.36 above normal, where the maximum pressure remained throughout the day; a. m. minimum temperatures, Virginia City and Cheyenne, 28°; Bismarck, 27°, and Pembina and Ft. Garry 26°; the NW. snow-storm in the Northwest con-

tinued during the early part of the day, and high north and northwest winds and gales during latter part of day at Pike's Peak, in western portions of Nebraska and Kansas, and on the coast of Texas. 4th, the pressure fell from Oregon to Colorado, and continued highest in the Southwest, the lowest a. m. temperature, 30°, (except in Dakota and Manitoba) occurring at Santa Fe and Ft. Craig, N. M. During the day the winds in the Southwest changed from northerly to southwesterly, a severe SW. gale and high sea being reported off the mouth of the Brazos river. 5th, the highest pressure was over the Gulf of Mexico, with brisk to high northerly winds in the East Gulf. Cautionary Off-shore signals were ordered on the morning of the 3d at Indianola and Galveston, and were justified by N. winds of 34 and 39 miles respectively.

No. II—formed in the Rocky Mountain region during 7th, in rear of storm-area No. V, and extended eastward. 8th, a. m., barometers above normal at Santa Fe, 0.28 inch; at Dodge City, 0.29, and at Cheyenne and North Platte, 0.26; minimum temperature, 30° at Cheyenne; northerly winds extended over the Southwest, with occasional heavy rains; Cautionary Off-shore Signals were ordered at Indianola and Galveston, the former of which was justified by a wind of 34 miles. 9th, the maximum pressures continued over the western plains and Missouri valley; 11 p. m., barometers at Dodge City, North Platte and Yankton, 0.42, 0.41 and 0.38 above normals, respectively. 10th, minimum a. m. temperatures were reported—at Deadwood and Breckenridge, 30°; Cheyenne, 31°; Pembina, Marquette and Rockliffe, 32°; 11 p. m., barometers at Fort Gibson, Yankton and Pembina, 0.30, 0.32 and 0.35 above normals, respectively; generally clear or fair weather prevailed west of the Mississippi, excepting light rains in southern Texas and New Mexico, but during the 11th and 12th cloud and rain increased from Texas to Dakota, the storm-center, No. VIII, probably developing in this region. 12th, a. m., barometers at Yankton, Breckenridge and Pembina, 0.35, 0.36 and 0.36 in. above normals, respectively; minimum temperatures, Pembina and Fort Garry, 24°; Yankton and Escanaba, 28°. 13th, a. m. barometers at Yankton, Breckenridge and Pembina, 0.23, 0.27 and 0.28, above normals, respectively; minimum temperatures, Pembina, 28°, Port Stanley, 29°, Breckenridge, Escanaba, Alpena and Rockliffe, 30°. 14th, a. m. barometer at Escanaba, 30.14, or 0.16 above normal; minimum temperatures, Saugeen, 27°, Escanaba, 28°, Alpena, 30°, Marquette, Parry Sound and Rochester, 31°. 15th, a. m. barometer at Father Point, 30.14, or 0.24 above normal, and at Chatham, 30.16, or 0.23 above normal; minimum temperatures, Rockliffe, 27°, Saugeen, Parry Sound and Chatham, 28°. From the 11th to the 14th quite severe and destructive frosts occurred in Iowa, the Lake States, Maryland, New Jersey and New England; ice formed very generally and snow was reported in Dakota, Iowa, Ontario, New York, Pennsylvania and northern portions of New Hampshire and Vermont.

No. III—appeared over Lake Superior during the night of the 16th., and on the 17th. extended eastward over the Lake region. 18th, a. m. barometer at Saugeen 0.26 in. above normal; 11 p. m. barometer at Father Point 0.34 above normal. On the morning of the 19th it appeared central over the Gulf of St. Lawrence, and the isobar 30.10 included the whole Atlantic States. During the 20th, the pressure gradually gave way in advance of storm-area No. IX, and during the 21st, this area disappeared to the eastward.

No. IV—appeared during the 20th, in the Northwest, in rear of storm-area No. IX, the isobar 30.10 extending southeastward to Lower Michigan, Indiana and western Tennessee by the morning of the 21st; southwestward of this area easterly winds and increasing cloudiness prevailed in advance of storm-area No. XII. Morning of the 22nd, isobar 30.20 included the Lake region, the pressure being 0.31 above normal at Escanaba, Saugeen and Parry Sound; minimum temperatures, Parry Sound, 32° and Rockliffe, 31°. During the day the centre remained almost stationary, but with a decrease of pressure, and, during the 23rd, this area was either dissipated or moved off to the northeastward.

No. V—The pressure rose during the 22nd in Oregon, Washington Ty., and Idaho, with clearing, followed by clear weather; remained high during the 23rd, and reached the maximum at Portland, Or. on the morning of the 24th; a. m. barometer 30.34 or 0.22 above the normal. During the rest of the day, however, the pressure fell in this district, but rose at the Rocky Mountain stations. 25th, a. m. barometer at Cheyenne and Denver, 0.24 and 0.27 above normals; the pressure remained high in this region throughout the 25th, but on the 26th this area was probably dissipated in advance of low pressure area No. XIII.

No. VI.—This area appeared over Manitoba on the 27th; spread over the Lake region during the 28th, and over lower Canada and northern portion of New England during the 30th and 31st.

Areas of Low Pressure in General.—Of these, thirteen have been well-marked and their tracks are shown on chart No. I. The most severe were Nos. I, V, VIII, IX and XII, the last being accompanied by the severe tornadoes of the 23rd in Wisconsin and Illinois. Nos. II, IV, VI, VII and X were subsidiary areas.

No. I.—This area of low-pressure probably developed in the Southwest during the 1st, when brisk to high southerly winds were reported in northern Texas and Indian Territory, and (at 11 p. m.) high northwest to northeast winds in Colorado and western Kansas; during the night of the 1st, it moved northeastward, and heavy rains were reported at Leavenworth, Des Moines and Dubuque. During the 2nd, it passed eastward over the Lake region, accompanied by brisk and high winds and light rains. Cautionary Signals were ordered up on the morning of the 2nd, on Lakes Michigan, Huron and Erie and maximum velocities were reported, as follows: Chicago, SW., 25 miles; Port Huron, S., 36; Saudusky, SW., 32, and Cleveland, S., 48. 3rd. the lowest pressure apparently remained north of Lake Ontario and New York, with continued rain, cloudy weather and thunder-storms in the Lower Lake region, and thence southwestward to the Gulf

coast. 4th, the lowest pressure probably continued in northeastern New York, the barometric trough extending southwestward along the Appalachian chain to Virginia; a severe thunder-storm occurred in Florida from 5:40 to 9:30 p. m., maximum velocity at Punta Rassa, NW. 36. At 7:35 a. m. of the 5th, the lowest pressure was recorded at Cape May, 29.57 or 0.46 in. below the normal; wind S., 31 miles. Northerly winds prevailed from Philadelphia to Washington, and westerly from Lynchburg to Wilmington; a severe thunder-storm, with hail, passed over Wilmington at 3 a. m.; wind NW., 52 miles; steamer "Northeast" blown ashore in Cape Fear river. At 4:35 p. m., the centre had apparently withdrawn to the northward; Quebec, 29.48 or 0.41 in. below normal, wind N., gale; heavy rain-falls were recorded on the North Carolina and New Jersey coasts, in the Hudson river valley and over Lake Champlain, and a severe gale prevailed on the New England coast. At 11 p. m., the centre had passed to the northeast; Father Point barometer 29.40 or 0.46 in. below normal, wind S., 19. Cautionary Signals were ordered, at midnight of the 2nd, from Sandy Hook to Cape May, and, on the morning of the 3rd, from Cape Lookout to Wood's Holl. At 4 p. m. and midnight of the 3rd, all signals were ordered down, but were again hoisted, on the morning of the 4th, at Cape May and on the coast of North Carolina. Morning of the 5th, signals were ordered up on the coast of New England from New York to Wood's Holl. The following maximum velocities were recorded: 3rd, Cape May, S., 36, and Kittyhawk, SW., 32. 4th, Kittyhawk, W., 48, and Cape May, S., 36; 5th, Cape Lookout, SW., 50; Cape Hatteras, SW., and Kittyhawk W., 48, and Wood's Holl, S., 45.

No. II.—During the 1st, a low pressure area existed in Manitoba. 2nd, a. m., barometer at Pembina, 29.56 or 0.39 in., below normal; during the day and night it was followed by high NW winds and snow, the area probably joining area No. I.

No. III.—was probably a depression passing northward off Nova Scotia and Cape Breton.

No. IV.—During the early morning of the 4th, the pressure fell at Duluth, with light rain, and a small area of low barometer, probably formed over western portion of Lake Superior, which moved eastward, during the day over Northern Michigan. Morning of the 5th, it was north of Lake Huron, and probably joined area No. I.

No. V.—As high-pressure area No. I moved towards the Southwest the pressure fell rapidly, and, during the 5th, an extensive area of low pressure appeared in the Northwest. At 4:35 and 11 p. m., the minimum pressure was recorded at Pembina, (29.44 or 0.38 and 29.42 or 0.44 below normals, respectively,) but at both these times of observation the low-pressure area appeared to extend southwestward to Salt Lake City, (29.55 or 0.31 in. and 29.61 or 0.25, respectively.) Brisk southwest to northwest winds, with partly cloudy weather, prevailed in Nevada and Utah, and, with rain, in Idaho; rain and sleet also prevailed in Montana and Dakota. 6th, the low area moved southeastward, and, at 11 p. m., was central from Kansas to Iowa, followed by high northerly winds in Nebraska, and heavy rains in Wyoming and Colorado, and preceded in the Upper Mississippi valley and Lake region by southerly winds, increasing cloudiness and light rains. On the night of the 6th a subsidiary centre formed in the Lake region, and, at 7:35 a. m., of the 7th, was central in Lower Michigan; it will be treated as area No. VI. During the 7th the present area moved eastward to Illinois, preceded by a thunder-storm on Lake Michigan. During the night it passed eastward to northern Indiana, with severe wind and rain-storms in its SW. quadrant; at 3 a. m., 8th, a severe wind and rain-storm passed over Memphis, and heavy rains fell in the valley of the Arkansas river. During the 8th it passed over the Lower Lake region, accompanied by light rains, and, on the 9th, disappeared to the northeastward. Cautionary Signals were ordered up, morning of the 9th, along the New Jersey and New England coasts, but were only justified at Eastport, Me., maximum wind E. 30 miles.

No. VI.—This area probably formed during the night of the 6th, in Wisconsin, subsidiary to area No. V. 7th, was central in the Lower Lake region, accompanied by numerous thunder-storms thence to the Ohio valley, and, by morning of the 8th, had disappeared. Cautionary signals were ordered, a. m. of the 7th, on Lakes Huron, Erie and Ontario. Maximum wind velocity, Cleveland, S.W., 36 miles.

No. VII.—was also subsidiary to storm-area No. V, and appeared as a separate depression, on the morning of the 9th, over the Middle Atlantic coast. During the latter part of the 8th, heavy thunder-storms were reported in Virginia; at Richmond a violent storm of wind, rain and hail was reported. 9th, 4:35 P. M., the centre had passed off the coast and was followed by brisk northeast to northwest winds and clearing weather. 10th, moved northeastward to Nova Scotia, accompanied by coast rains. 11th, remained over the Canadian Maritime Provinces, and, on the 12th, moved eastward, followed by westerly winds and clearing weather.

No. VIII.—probably developed during the 11th over the high lands of northwestern Texas and western Kansas; at 11 p. m., high northeast winds prevailed in latter section, and southeast winds and cloudy weather thence to the Lower-Mississippi valley and East Gulf coast; northeast winds and rain in Kansas and Missouri. 12th, remained in the Southwest, but on the 13th moved eastward to Alabama, accompanied by cloudy weather and light rains from the Gulf coast to the Ohio valley. At 7:35 a. m., 14th, it was central in Georgia, with south to east winds, threatening and cloudy weather, and light rains thence to the South Atlantic coast and Virginia. The Cautionary Signals, ordered up on the morning of the 12th, in advance of a small depression, which had probably developed during the early morning in the interior of the South Atlantic States, were continued, and signals were also ordered up, on the morning of the 14th, at Wilmington and Smithville. At 4:35 p. m. it was central in South Carolina, and brisk to high southeast

winds prevailed along the coast from Cape Lookout to Cape Henry; 11 p. m., central on coast of North Carolina, SE to NE gales and heavy rains prevailing from Hatteras to Henry; steamer "Resolute", 60 miles off Hatteras in Gulf Stream, reports "regular cyclone", and steamer "Columbus", 60 miles north of Hatteras, "severe easterly gales from SE to NE and N, with terrific squalls and bad cross-seas." 15th, 7:35 a. m., centre had passed off the coast, and E to NW high winds and gales prevailed on the New Jersey and North Carolina coasts; unusually high tides occurred, and Chesapeake Bay was considered too rough for Baltimore steamers to leave; ship "Eastern Star", lat. $37^{\circ} 30' N.$, long. $74^{\circ} W.$, reports "heavy gale backing to NE, and blowing hurricane for 18 hours." During the rest of the day the winds along the coast decreased, with clearing weather, and the storm-centre moved northeastward, with light rains along the New England and Nova Scotian coasts. Cautionary Signals were ordered up, afternoon of the 14th, from Cape May to Sandy Hook, and, morning of the 15th, from New York to Eastport. Maximum velocities—Smithville, SE., 31 miles; Capes Lookout and Henry, NE., 48; Cape Hatteras, SE., and Kittyhawk, N., 56; Atlantic City, NE., 44; Barnegat, E., 45; Sandy Hook, NE., 36, and Thatcher's Island, NE. 32. In rear of this storm the temperature fell quiet low, and severe frosts were reported on the morning of the 16th in Pennsylvania and Virginia.

No. IX.—During the 15th high temperatures were recorded in northwestern Texas and New Mexico; south to east winds, occasionally high, from the West Gulf coast to Iowa, and northerly winds from New Mexico to Wyoming; heavy rains and thunder-storms occurred in southern Texas, Indian Territory and Nebraska. At 4.35 p. m. the lowest barometers were at Dodge City (29.14, or 0.18 in. below normal), and Ft. Sill (29.42, or 0.24). On the 16th heavy snows and rains were reported in Utah and Colorado, and at 11 p. m. the lowest barometers were at Cheyenne (29.64, or 0.26 below normal), and Denver, (29.57, or 0.36), the latter being the lowest pressure recorded at the station during the month. A southwest gale of 52 miles prevailed on Pike's Peak, with light snow. 17th, the centre moved slowly eastward, preceded by brisk to high southerly winds and high temperatures in northern Texas and Indian Territory, (92° at Ft. Griffin, 4.35 p. m.) and followed by northerly winds and low temperatures from New Mexico to Dakota, (35° at Santa Fe. 11 p. m., with snow). 18th, centre moved northward from Kansas and Nebraska to southern Dakota; a terrific thunder-storm passed over Leavenworth during the early morning; during the middle of the day heavy rains fell at Corsicana, Dodge City and Lexington, and during the evening severe winds and rain-storms, as follows: Vicksburg, 7 p. m., terrific rain and wind-storm, maximum velocity, 55 miles, rainfall, 2.14 in.; Carolina Landing, (50 miles north of Vicksburg,) destructive tornado, buildings destroyed; Little Rock, heavy and destructive storm; St. Louis, very heavy wind and rain-storm, much damage, maximum velocity, at 1 p. m., NW., 60 miles; Poseyville, Ind., tornado. On the 19th heavy rains fell at New Orleans, Mobile and Punta Rassa, viz.: 3.54, 1.58 and 3.10 inches respectively; at Punta Rassa, wind NW. 36 veering to E. 32 miles, during heavy thunder-storm from 7.25 p. m. to midnight. 19th, centre moved eastward to southern Minnesota, and the area of cloud and rain extended over the Lake region; a thunder-storm, high winds and rough seas occurred on Lake Michigan. 20th, centre passed into Ontario; a severe SW. gale prevailed at New Corydon, and a terrific thunder-storm at Logansport, (1.30 a. m.), Ind.; disastrous hail and rain-storm at Wheeling, W. Va., and severe thunder-storms at Cleveland, Rochester and Toronto. Cautionary Signals were ordered up on Lakes Superior and Michigan at midnight of the 17th; Huron and Erie during the 18th, and on Ontario on the 19th. Maximum velocities, Duluth, NE. 42 miles; Milwaukee, E. 36; Port Huron, W. 36; Toledo, SW. 48; Sandusky, W. 39; Cleveland, S. 49, and Erie, S. 34. 21st, centre moved into the St. Lawrence valley; between 2 and 3 a. m. heavy thunder-storms were reported at Baltimore and Newark, and a subsidiary area, No. X, formed during the day in Virginia. During the 22d the present area passed southeastward to the Atlantic, and rains continued for several days in the Canadian maritime provinces, which were specially heavy in Nova Scotia during the 22d and 23d. Cautionary Signals were ordered on the 19th from Cape Lookout to Sandy Hook, and on the 20th from New York to Eastport. Maximum velocities, Sandy Hook, SE., 34; New London, SE. 36. On the 22d, as the storm-centre passed southeastward from the St. Lawrence valley to the Atlantic, a velocity of 81 miles per hour was recorded on the summit of Mt. Washington.

No. X.—probably formed during latter part of the 20th in West Virginia, passed southeastward during the 21st, over Virginia, and thence off the coast of North Carolina.

No. XI.—This area was first noticed in California and Nevada on the 19th, where it was accompanied by rain, and, in the mountains, snow; lowest pressure at San Francisco, 4:35 P. M., 20th., 29.68 or 0.30 below normal. 20th, rain extended to Idaho, Utah and Colorado. 21st, 4:35 P. M., lowest pressure at Portland, Or., 29.79 or 0.28 below normal.

No. XII.—During the 21st, while high-pressure area No. X was central over the Upper Lakes, easterly winds and increasing cloudiness prevailed from Texas to the Northwest; heavy rains and SE. gales prevailed in Wyoming, Colorado and western Kansas, and a severe E. thunder-storm, followed by floods, in northern Texas. 22nd, the lowest pressure was probably north of Montana and Dakota, but the barometric trough extended southward to Texas, with southerly winds; northwesterly winds prevailing at the Rocky Mountain stations. At Ft. Fetterman, a high W. wind prevailed all day, with light rain; in El Paso and Douglas Cos., Col., a terrific rain-storm, flooding all streams, and carrying away railroad bridges, &c.; on Pike's Peak, a SW. gale all day, maximum velocity, 84 miles. 23rd, lowest pressure probably in Manitoba, (Pembina, 7:35 a. m., 29.48 or 0.42 below normal); cloud and rain extended over Lake region and Ohio valley; very destructive tornadoes occurred from 3:30 to 6 p. m., at places in southern Wisconsin and

northern Illinois (which will be more fully noticed under the head of "Tornadoes"), and thunder-storms were general in the Upper Lake region. Cautionary Signals were ordered up on Lake Superior and the western shore of Lake Michigan, on the evening and midnight of the 22nd, and for eastern shore of Lake Michigan, and Lakes Huron and Erie on the 23rd. Maximum velocities, Marquette, SE., 30 miles; Milwaukee, SW., 48, and Alpena, W., 28. 24th to 27th, centre moved eastward to the Gulf of St. Lawrence, probably about as shown on the chart of storm-tracks; severe thunder-storms were reported on the 25th in North Carolina, where heavy hail did considerable damage to crops, and in New Hampshire; 26th, severe thunder-storm near Providence, R. I., and hail-storm at Cooperstown, N. Y.; On the summit of Mt. Washington, a severe thunder-storm with hail occurred, during which the wires were so powerfully affected that it was necessary to withdraw the switch cut-out; 27th, hurricane from NW., 102 miles per hour.

No. XIII—probably developed in Nevada, Utah and southern Idaho on the 27th, while high-pressure area No. VI was in Manitoba. During the latter part of the 26th the pressure fell from California to Utah, and, at 11 p. m., 27th, the lowest barometer was at Salt Lake City, (29.47, or 0.39 below normal;) cloudy and threatening weather and light rains extended thence to Dakota, Nebraska and Kansas, with high south winds in two latter. 28th, 4:35 p. m., Salt Lake City, barometer 29.50, or 0.36 below normal, with brisk to high southeast to southwest winds in Nevada and Utah. From 11 p. m., of the 28th, to 11 p. m., 29th, the barometers were lowest at Cheyenne and Denver, (ranging from 0.08 to 0.19 below normal,) and, during the afternoon of the 29th, the observer on the summit of Pike's Peak reported a southwest gale of 80 miles per hour, "blowing towards a heavy local storm over the plains about 20 miles to the northeast." During the afternoon of the 30th the centre probably moved south-eastward to western Kansas; a very severe hail-storm occurred during the afternoon at North Platte—the observer states "hail fell as large as hen's eggs, some masses of ice weighed 1½ lbs, breaking all glass on W, NW and N exposures and cutting holes in tin roofs; temperature fell 21° in 10 minutes; storm extended 15 miles in length and 5 in width." 4:35 p. m. temperature at North Platte, 62°, wind N, 24 miles; Dodge City, 92°, wind SW, 20. During the 31st, the lowest pressure remained almost stationary, but severe local storms occurred in Missouri and Illinois; Springfield, Mo., 5:15 p. m., heavy wind and rain storm—total rainfall 3.25 inches, max. vel. of wind 60 miles, veering to N, with hail. Gardner, Ill., tornado, destroying buildings. Davenport, Ia., severe thunder-storm, wind SE, 48 miles, blowing down trees &c; "during the severe wind several whirlwinds formed along the river, which gathered up the water and whirled it upward ten to twenty feet in spiral columns."

No. XIV.—During the early morning of the 29th, a severe thunder-storm prevailed in southern Iowa, accompanied by very heavy rains; six inches fell at Glenwood, Mills Co., causing heavy floods, and, during the day the barometric trough extended eastward from area No. XIII throughout the Ohio valley, in which region a distinct area of low pressure formed by morning of the 30th. This area passed over the Middle Atlantic States, during the latter part of the day, accompanied by heavy thunder-storms.

INTERNATIONAL METEOROLOGY.

April 10th, lat. 27° 30' S., 105° 48' W., violent hurricane. 11th, Bark Lilly Grace, from Pabellon de Pica for New York, reports: "experienced terrible hurricane during night, in lat. 36° S., put into Valparaiso, April 24th. 21st, 26° N., 56° W., heavy gale; 43° N., 44° W., hurricane, sea mountains high; 38° N., 60° W., heavy seas. 30th, 51° 02' N., 25° 02' W., fresh northeast to northwest winds and squalls.

May 1st, first arrival of season at Halifax, N. S., from Magdalen Islands, reported unusually mild winter, little snow and islands clear of ice until February; 48° 26' N., 31° 40' W., strong NW. breeze, squalls; 47° 01' N., 34° 38' W., heavy NW. rain-squalls; 50° 38' N., 33° 00' W., fresh NW. gale, hard squalls and heavy sea. 2nd, 46° 28' N., 38° 16' W., fresh NW. breeze and squalls; 50° 28' N., 38° 06' W., strong NNW. gale, heavy sea. 3rd., 44° 36' N., 44° 52' W., fresh SSW. gale; 43° 56' N., 46° 41' W., stormy, wind SW. much water on deck. 4th, 45° 46' N., 46° 10' W., strong W. gale; 49° 26' N., 29° 37' W., wind WSW., stormy, rain and high sea; 42° 58' N., 49° 20' W., strong WNW. and NNW. gale, high confused sea; 43° 04' N., 50° 50' W., westerly storm, much water on deck; 49° 38' N., 29° 40' W., WSW. gale, high sea; 47° 58' N., 31° 26' W., SW. gale, high sea; 50° 24' N., 19° 29' W., W. gale, rain, high sea; 51° 11' N., 29° 09' W., (7:35 a. m., Washington mean time) barometer 29.18, S. 5° W. gale and high sea. 5th, 48° 06' N., 35° 16' W., SW. to N., stormy, much rain and cross-sea. 6th, 49° 31' N., 27° 56' W., strong N. to W. gale and heavy sea; 48° 36' N., 30° 27' W. hard NW. gale and heavy sea; 51° 06' N., 16° 38' W. high NW. sea; 54° 30' N., 15° 38' W., (7:35 a. m., Wash. mean time) barometer 29.15, S. 68° E. gale with incessant rain. 7th., 47° 58' N., 35° 18' W. hard northerly gale and squalls; 49° 12' N., 19° 43' W., WNW. stormy, heavy sea; 50° 50' N., 23° 12' W., high NW. sea; 54° 50' N., 20° 59' W. strong, SE. gale and heavy rain. 9th., 47° 11' N., 35° 39' W., high seas; 49° 54' N., 39° 05' W., fresh NE. to N. gale, high N. sea. 10th, 45° 37' N., 43° 25' W., high seas; 48° 14' N., 46° 29' W., dense fog, high sea swell. 11th., 37° N., 69° W., "tornado" from NW.; 46° 10' N., 53° 15' W., dense fog and heavy rain. 12th., 43° 37' N., 58° 52' W., dense fog; 49° 42' N., 10° 10' W. and 49° 48' N., 8° 45' W., high seas. 13th., 41° 13' N., 62° 51' W., WNW., stormy; 45° 03' N., 39° 58' W., WNW. strong wind and high sea; 51° 05' N., 16° 29' W., SW. stormy, rain and high cross sea. 14th, 45° 55' N., 44° 08' W., NW. squally, high sea; 49° 55' N., 24° 47' W., WNW. rain-squalls; 48° 58' N., 23° 04' W., very heavy sea. 15th, 43° 58' N., 46° 09' W., high confused sea; 48° 00' N., 32° 30' W., high swell; 48° 07' N., 30° 58' W., NW. stormy; 49° 57' N., 5° 00' W.,